

IN THE CLAIMS

Please cancel claims 1-72 and add claims 74 and 75 without prejudice.

73. (Original) A structure formed on a substrate comprising:

a material layer formed on the substrate in which the material layer is pretreated by introducing a radical specie including any combination of O₂, H₂, H₂O, NH₃, NF₃, N₂, Cl and F to increase AH_x termination sites on the surface of the material layer, where x is an integer and A is a non-metal capable of bonding with hydrogen H;

a film layer formed above said material layer by repeated introduction of a first precursor followed by a second precursor to deposit said film layer by atomic layer deposition, the first precursor to deposit a first reactive specie on the surface of the material layer, the surface when pretreated being more receptive to have additional bonding with the first reactive specie, due to the increase of AH_x termination sites on the surface and the second precursor to deposit a second reactive specie to react with the deposited first reactive specie to form said film layer.

74. (New) A method to perform atomic layer deposition comprising:

pretreating a surface of a substrate or a material layer formed on the substrate by introducing a radical specie including any combination of O₂, H₂, H₂O, NH₂, NF₃, N₂, Cl and F to increase AH_x termination sites on the surface, where x is an integer and A is a non-metal capable of bonding with hydrogen H, said pretreating further including introducing the radical specie by a plasma;

introducing a first precursor to deposit a first reactive specie on the surface, the surface when pretreated being more receptive to have additional bonding with the first reactive specie, due to the increase of AH_x termination sites on the surface; and

introducing a second precursor, after the bonding of the first reactive specie, to deposit a second reactive specie to react with the deposit first reactive specie to form a film layer,

wherein Al₂O₃ is deposited on TiXN, wherein X may be Al, Si or W by atomic layer deposition in which said pretreating includes introducing NH₃/H₂/N₂ plasma to form NH_x as the termination sites on Al₂O₃.

75. (New) A method to perform atomic layer deposition comprising:

pretreating a surface of a substrate or a material layer formed on the substrate by introducing a radical specie including any combination of O_2 , H_2 , H_2O , NH_2 , NF_3 , N_2 , C_1 and F to increase AH_x termination sites on the surface, where x is an integer and A is a non-metal capable of bonding with hydrogen H , said pretreating further including introducing the radical specie by a plasma;

introducing a first precursor to deposit a first reactive specie on the surface, the surface when preteated being more receptive to have additional bonding with the first reactive specie, due to the increase of AH_x termination sites on the surface; and

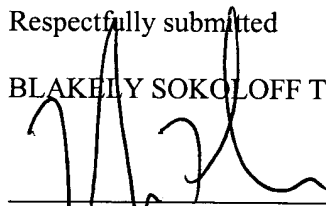
introducing a second precursor, after the bonding of the first reactive specie, to deposit a second reactive specie to react with the deposit first reactive specie to form a film layer,

wherein HfO_2 , ZrO_2 or La_2O_3 is deposited on Al_2O_3 by atomic layer deposition in which said pretreating includes introducing $O_2/H_2/H_2O$ plasma to form NH_x as the termination sites on TiN .

If there are any additional fees associated with this communication, please charge our Deposit Account No. 02-2666.

Respectfully submitted

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP



Tarek N. Fahmi
Reg/No.: 41,402

Date: September 18, 2003

12400 Wilshire Blvd.
Seventh Floor
Los Angeles, CA 90025-1026
(408) 947.8200